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Presentation Title: "Evaluation of Graphite Fiber/Polyimide PMCs from Hot Melt vs Solution Prepreg"

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ABSTRACT

Carbon fiber reinforced high temperature polymer matrix composites (PMC) have been extensively investigated as potential weight reduction replacements of various metallic components in next generation high performance propulsion rocket engines. The initial phase involves development of comprehensive composite material-process-structure-design-property-in-service performance correlations and database, especially for a high stiffness facesheet of various sandwich structures. Overview of the program plan, technical approaches and current multi-team efforts will be presented. During composite fabrication, it was found that the two large volume commercial prepregging methods (hot-melt vs. solution) resulted in considerably different composite cure behavior. Details of the process-induced physical and chemical modifications in the prepregs, their effects on composite processing, and systematic cure cycle optimization studies will be discussed. The combined effects of prepregging method and cure cycle modification on composite properties and isothermal aging performance were also evaluated.

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